United Nations E/CN.17/2001/8

Economic and Social Council

Distr.: General
19 January 2001

Original: English

Commission on Sustainable Development
Ninth session
16-27 April 2001

Letter dated 17 January 2001 from the Permanent Representative of Canada to the United Nations addressed to the Secretary-General

I have the honour to transmit to you the report of the International Expert Meeting on Information for Decision-making and Participation, which was held in Aylmer, Canada, from 25 to 28 September 2000 (see annex).

I should be grateful if you would have this letter and its annex circulated as a document of the Commission on Sustainable Development at its ninth session.

(*Signed*) Paul **Heinbecker**
Ambassador
Permanent Representative

01-23120 (E) 130201

Annex to the letter dated 17 January 2001 from the Permanent Representative of Canada to the United Nations addressed to the Secretary-General

Report of the International Expert Meeting on Information for Decision-making and Participation

Aylmer, Quebec
25-28 September 2000

Sponsored by:

The Government of Canada

and

The United Nations Department of Economic and Social Affairs
The United Nations Environment Programme (UNEP)

GRANDMOTHER
had a food dish made from birch bark.
Her philosophy was that the bark dish represented the abundance of Mother Earth in sustaining life. Grandmother said that she offered her food dish to whoever wished to eat. When she became too old to prepare her food, we would take our turn to put food in to her plate. Grandmother lived a long and healthy life, over one hundred years. Now I must take care of Grandmother's dish because it is my dish.
Now I am GRANDFATHER.

Stephen Augustine, Mi'Kmag Hereditary Chief
CSD International Expert Meeting on
Information for Decision-Making,
Aylmer PQ September 26, 2000

I. INTRODUCTION

1. The International Expert Meeting on Information for Decision-making and Participation, was convened in Aylmer, Quebec under the sponsorship of the Government of Canada, with the contribution and support of Environment Canada, Agriculture and Agri-Food Canada, the Canadian International Development Agency, the Department of Foreign Affairs and International Trade, Health Canada, Industry Canada, and Natural Resources Canada. The United Nations through its Department of Economic and Social Affairs (DESA) and UNEP were co-sponsors of the meeting. The Agenda of the meeting, its themes, working groups and speakers are attached as Annex 2.

2. The meeting was chaired by Ms. Elizabeth Dowdeswell, former Under-Secretary-General and Executive Director of the United Nations Environment Programme. The meeting was opened with a statement by Dr. Robert Slater, Senior Assistant Deputy Minister, Environment Canada on behalf of the Government of Canada. The Chairman of the Bureau of the CSD, Mr. Bedrich Moldan, participated and addressed the meeting. Welcoming statements were made by Mr. Arthur Dahl on behalf of UNEP and Mr. Lowell Flanders on behalf of the Department of Economic and Social Affairs. In all, the meeting attracted the participation of senior level experts from a representative group of 29 developed and developing countries from all regions of the world. In addition, five non-governmental organizations were represented as well as several private sector companies. Nine experts from a variety of academic and research institutions were invited to participate in their individual capacities. Seven UN system agencies were represented as well as one member of the CSD Bureau. The full list of participants is attached as an Annex 3 to this report.

3. On Monday, 25 September 2000, Mr. Flanders conducted informal consultations with countries involved in the testing of the CSD indicators of sustainable development. Other participants who were available also took part in the consultation. Mr. Flanders briefed participants and testing country representatives on the actions taken by the secretariat since the meeting in Barbados in December 1999 to further revise, refine and update the framework, methodologies and list of indicators. At the opening session on Tuesday, Mr. Flanders made a power point presentation on the evolution of the CSD Work Programme on Indicators of Sustainable Development. The issue of indicators came up at several different points during the course of the meeting.

4. The meeting was conducted through plenary and working group sessions. The meeting had three main themes each of which was addressed through three working groups. Each theme was opened by a keynote presentation while each working group was opened by a short introductory presentation or "conversation starter" to get the working group underway. Brief summaries of each presentation are contained in Annex 1.

II. BACKGROUND TO THE MEETING

5. The CSD Programme of Work for the ninth session of the CSD in 2001 included information for decision-making and participation (Chapter 40 of Agenda 21) as a key cross-sectoral theme for review and action. Thorough consideration of the issues raised by Chapter 40 is not only important in the context of the CSD's Ninth session, but also in relation to preparations for the 2002 review of Agenda 21, since this may be the only opportunity to give particular attention to this Chapter prior to the review itself. The international expert meeting on information for decision-making and participation was organized to consider some of the key issues raised by Chapter 40 and to provide considered advice and recommendations to the CSD on the kinds of policies that could be adopted by governments to further its implementation.

6. Chapter 40 of Agenda 21 specifically calls for implementation of two programme areas: (a) bridging the data gap and (b) improving the availability of information. It has been evident in recent years that access to information is essential in the planning, design and monitoring of policies to support sustainable development at the regional, national and international levels. At the Government level, a growing number of countries are carrying out national data inventories, organizing the collection and dissemination of data, and developing information systems.

7. Great differences also exist between geographical regions and countries at different stages of development, as to the availability of relevant primary data in the area of sustainable development. The quality, comparability and frequency of data compilation and the subsequent quality of information systems are critical issues. The integration and use of the available information in decision-making processes, at all levels, in a timely and appropriate fashion and the accessibility of the public to such information are issues of great concern. The International Expert Meeting sought to identify common approaches to the analysis of access to and use of information while focusing specifically on the two programme areas requiring implementation as part of Chapter 40 of Agenda 21.

III. SUMMARY OF INTRODUCTORY STATEMENTS

8. Mrs. Elizabeth Dowdeswell, as Chairperson, opened the meeting and welcomed participants on behalf of the organizers of the meeting - the UN Department of Economic and Social Affairs and the UN Environment Program - and the hosts - Environment Canada.

9. She noted that eight years ago in Rio, governments articulated their commitment to bridging the gap between industrialized and developing countries in the availability, quality, coherence, standardization and accessibility of data. Chapter 40 of Agenda 21 recognized that "Knowledge Is Power;" that information is fundamental to development; and that there is a "Digital Divide" - a growing gap between rich and poor as high technology becomes such an important part of the global economy.

10. She said that the background paper prepared for the meeting underscored just how much more important this issue has become in the years since UNCED. The "new economy" has arrived. (E-commerce is growing by 100% a year; India's software exports are expected to grow from $4 B at present to about $100B by 2005).

11. The nature of wealth generation has changed as focus has shifted to the new knowledge economy. With it has come the potential for enhancing the concept of global solidarity (as information technologies decrease time and space) - or - if only an elite continue to have access - a potential for deeper division and inequality.

12. For those who believe that democracy and good governance are the keys to development, information technologies enable transparency. Widespread access to and use of knowledge by all participants in society - policy makers, the private sector, NGOs, academics, students, the media and civil society can lead to participatory democracy. Information technologies, she stressed, not only shape our worldview, but also give us greater power as individuals and citizens to change the world.

13. It is in the exchange of knowledge and experience that many solutions to development problems can be found. She pointed to the experience gained from Egypt's cyber-cafes for the poor, to Jamaica's rural cyber-centres, to Cameroon's use of information to get a good price for agricultural products, and to Malaysia's experience with mobile Internet units, as well as Estonia's policy of internet access being a human right. She mentioned the generosity of the private sector in making hardware available to provide medical information and assist in emergency relief.

14. While access to hardware and software is important; in many ways, that's the easy part. But even more important is developing the human capacity to make judgments about information, to integrate information so that it can support holistic sustainable development initiatives and to transform information into knowledge.

15. Mrs. Dowdeswell focused the attention of the experts on 2 main challenges: one, to create a more level playing field for decision-makers around the globe, and second to understand the full potential of new technologies.

16. She called on the participants to harness their expertise to:

- provide advice and recommendations to the forthcoming meeting of CSD - CSD9 - on the kinds of policies that should be adopted by governments to further implementation of Chapter 40, and

- provide substantive inputs for the report of the Secretary General -for CSD9 and ultimately in preparation for Rio + 10.

17. In closing, she said that participants have a significant opportunity to make a strong contribution - both conceptually and pragmatically - to the next steps in bringing about global sustainability.

18. Dr. Robert Slater, Senior Assistant Deputy Minister, Environment Canada, welcomed participants on behalf of the Government of Canada and Environment Canada. He quoted Arthur Campeau (former Canadian Ambassador for the Environment) to the effect that the challenge is whether we as humans are smart enough to take avoidance action before catastrophe takes place, whether we have evolved beyond our 'reptilian brains.' Humans need to make a lighter footprint on the earth and through information we can give a voice to the environment, which cannot speak for itself. Compared to the general economy, the environment is like a "tinkling bell," a barely audible voice. While the Canadian economy had passed the trillion-dollar mark, there is no measure of environmental value. He noted however that Canada's last budget provided for a more a deliberate and systematic look at sustainable development, particularly in terms of developing indicators of sustainable development (SD) indicators. Two initiatives will address this: a new national task force to

be announced in the following week to lead the design of an integrated knowledge management system for environmental information. The National Round Table on the Environment and the Economy (an independent but government-funded group) will lead a complementary initiative to develop, pretest and promote indicators of sustainable development. There is a need for macro-level indicators to describe environmental conditions and the status of sustainable development. Sustainable development indicators need to be effective, and need vigorous discussion. There is a need for macro-level indicators to describe environmental conditions and the status of sustainable development. This effort will require patience; it took 50 years to establish a dependable set of economic indicators. A variety of organizations have been doing good work on development of indicators and other methods of measurement. He noted in particular the work of the World Bank using the notion of natural capital. He noted that an expert meeting such as the one being convened is a learning experience - an opportunity to learn by mistakes and learn from the best practices of others. He wished the participants success as they brought the light of their experience to bear on the issue of information for decision-making and participation.

19. Mr. Arthur Dahl, representing the United Nations Environment Programme (UNEP) welcomed the participants and highlighted the importance UNEP placed on adequate global environmental observing, assessment and reporting. UNEP's own contributions included its Global Environment Outlook (GEO) reports, its coordination of the UN system-wide Earthwatch, its participation in the Integrated Global Observing Strategy (IGOS) Partnership and the Global Observing Systems, and its joint role with DESA as Task Manager for Chapter 40 of Agenda 21. UNEP's Division of Environmental Information, Assessment and Early Warning is presently designing a new global environmental information system, in collaboration with UN agencies, the private sector and NGOs, which will make it possible to integrate multiple layers of information from many sources for decision support and public information.

20. Mr. Dahl also summarized the results of the recent Global Conference on Facilitating Access to Environmental Information (Dublin, 11-15 September 2000). The Conference called on countries to enhance networking and coordination, primarily through consortia of key environmental information suppliers using web-based technologies, for an integrated information service in each country. It also called on governments to support UNEP in the development of a global environmental portal on the Internet, and to consider acceding to the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, or developing similar regional conventions.

21. Mr. Flanders on behalf of the Department of Economic and Social Affairs welcomed all of the participants and extended thanks to the Chairperson, Ms. Dowdeswell for kindly agreeing to manage the deliberations. He also thanked the many agencies of the Canadian Government for supporting the meeting. This included most particularly Environment Canada for hosting and organizing the meeting. Working with Environment Canada, were Agriculture and Agri-Food Canada, the Canadian International Development Agency (CIDA), the Department of Foreign Affairs and International Trade, Health Canada, Industry Canada and Natural Resources Canada. All of these organizations put in an enormous amount of work to make it possible for the meeting to be a success.

22. Mr. Flanders reviewed for participants how the meeting would be conducted. He noted that the main challenge of information for decision-making and participation is not lack of information, but its excess. The real task is to organize information so that we can make the best use of it. Everyone who has accessed the World Wide Web knows the wealth of information that exists and the challenge of finding the information you need quickly and efficiently. For policy makers, putting information in digestible packets that can make a difference in how decisions are made is critical. In the United Nations a number of important recent meetings have devoted considerable attention to information and technology needs, including a high level segment of the Economic and Social Council and the recent Millennium Assembly. Although some have emphasized the so-called "digital divide," he expressed hope that the meeting could focus on the ways in which information and information technologies can unite rather than divide us. Because if the information revolution has any meaning, it is in the ways that access to information can bring people closer together as a global community. While globalization may have its downside, the upside is that through greater sharing of information and knowledge, we can better appreciate our bond as human beings since we all share with our planet a common fate.

IV. MAIN CONCLUSIONS AND RECOMMENDATIONS

A. Access To and Uses of Information

Public Access and Participation

23. Reliable access to information is essential for knowledge-based decision-making. Access to sustainable development sources of data and information at the right time and at the right cost is critical. Free, open and unrestricted access, as appropriate, to sustainable development information is indispensable.

24. The management of data, information and knowledge is crucial to sustainable development. Keeping in mind issues of equity, inclusiveness, transparency, predictability, and efficiency, the meeting stressed the need for governments to:

(a) Develop a multi-media, and as appropriate, multi-lingual, communication strategy to promote wider public access. The strategy should encompass all types of communication tools, from traditional and non-formal, to advanced, modern technologies and operate at all levels from local to global.

(b) Consult with major groups and other stakeholders about information technology development and applications with a view to establishing systems and mechanisms that involve all segments within society in all stages of the information technology process.

(c)Encourage and support the development of appropriate institutional and regulatory frameworks for data gathering, sharing, diffusion and use of information, by reviewing existing rules, modalities and protocols with the aim of making information more accessible to all citizens.

(d) Encourage sustainable development by implementing appropriate capacity building and developing appropriate infrastructure to support full participation in the rapidly expanding information-based knowledge economy.

(e) Facilitate public access to sources of relevant sustainable development data and information. Disclosure principles and policies should be negotiated in an open multi-stakeholder process at national, regional and international levels.

(f) Publish clear and concise information about sustainable development that can be easily captured and understood by the public. This information should be linked over the web to more complex data so that it allows different audiences to access different levels of complexity.

(g) Urge the CSD to recommend the development and establishment of a minimum set or common "benchmarks" for disclosure policies and/or practices by public agencies including governments, guarantee and financing agencies, regional and global public institutions or processes, and regional or global financial institutions.

25. An increasing amount of information relevant to sustainable development is being generated by the private sector. The outsourcing, privatization or commercialization of information that has traditionally been in the public domain may limit the availability and access to information by people in both developed and developing countries. The meeting:

(a) Recommends that the public's access to information be maintained by discouraging and/or regulating, as appropriate, the migration of public or publicly held information into limited access commercial information systems.

(b) Calls on the CSD to initiate, in collaboration with global business and other stakeholder consortia, a review of the rules, modalities and protocols for access to relevant sustainable development information. Issues to be addressed in the review could include, *inter alia*, confidentiality, privacy and the scope of information for the "public good".[1]

[1] Considerations in defining the domain of public information, include the need for consistent organization of the information needed to assess significant social, environmental and development trends and impacts related to investment decisions; existing information tools and existing global commitments by governments (e.g. the Climate Convention), etc

Information Integration and Coordination

26. The lack of a clear political mandate to more fully integrate national sources of data and indicators for sustainable development, and to provide public access to information was seen as a major political challenge. The meeting:

(a) Calls upon Governments to make a high level commitment to the need to establish national integrated information systems for decision making for sustainable development.

(b) Emphasizes the importance of public participation in improving the quality of data and in sustaining the political will needed to support a strong information infrastructure.

(c) Recommends the development of a directory of meta-data repositories at various administrative levels containing easily available data compiled in ways that are usable by policymakers.

27. The lack of full and effective cooperation between departments and institutions both at the national and international levels responsible for data collection and indicators, often leads to inefficient information management due to duplication of surveys, inconsistent methodologies and inefficient use of information. The need to more clearly identify the national units or agencies responsible for coordinating and/or compiling data was highlighted. The meeting:

(a) Calls on member states to endorse development of the CSD secretariat website into a network portal responsible for linking the different international institutions that are responsible for sustainable development data and indicator sources.

(b) Recommends that the role of the private sector, NGOs and other major groups in data analysis and reporting be taken more fully into account in national information systems.

(c) Encourages countries that have experience with sustainable development information systems and indicators to twin[2] with other countries and provide knowledge and assistance for capacity building, especially between developed and developing countries.

28. Problems of definition, differences in reporting periods, statistical and measurement methods (for example, scope and scale) were identified as technical constraints facing many countries. The meeting.

(a) Encourages Governments and international organizations to work together, at the national and international level, to address technical differences in methods, reporting periods, data collection and aggregation, and in this regard, stresses the importance of using common methodologies for data and indicators of sustainable development (e.g. the UNCSD indicator methodology sheets).

[2]Testing countries noted that twinning has proved particularly beneficial in the context of the CSD Work Programme on Indicators of Sustainable Development.

(b) Encourages the greater use of spatial information systems to combine and integrate economic, social and environmental information. Use of data at different geographical scales would be improved by geo-coding of such data.

CSD Work Programme on Indicators of Sustainable Development

29. The meeting:

(a) Expresses appreciation for the progress achieved and the contribution made by testing countries in finalizing a core set of indicators of sustainable development organized by themes and sub-themes under the CSD Programme on Indicators of Sustainable Development.

(b) Recommends that the Commission on Sustainable Development endorse the core set of indicators thus developed as a valuable starting point for countries that may wish to organize and elaborate their own national programmes for the testing, development and use of national level indicators of sustainable development.[3]

(c) Urges the Commission to continue its Work Programme on indicators of sustainable development, giving particular attention in the next phase to assisting developing countries, and countries with economies in transition, that may want to develop a national indicators programme with technical information, advice and capacity building support and to advance further work on modalities for the linkage and aggregation of indicators, building on and cooperating with existing research and development efforts

(c) Strongly recommends that all stakeholders be closely involved in the development and use of indicators of sustainable development.

(d) Urges all countries to make better use of indicators, indices and other statistical measures appropriate to specific national conditions and priorities, to more closely monitor and report on progress being made at the national, regional and local levels towards defining and achieving national goals for sustainable development.

Uses of Traditional Information

"Who speaks for the Earth? Trees and animals don't speak in human language. Those few humans in communities that still realize they are part of Nature, sometimes speak not just for themselves but for that whole Nature of which we all are a part".

Thomas Banyacya, Hopi Elder
December 1992

30. The meeting stressed the importance of diversity as a fundamental prerequisite of all life Similarly, a diversity of worldviews supports human adaptability and resilience. Since

[3] The Expert from Australia reserved his position on this point.

traditional knowledge is linked to people who have direct access to and experience with nature's resources, decision-makers need to recognize and respect the existence of multiple knowledge systems and incorporate to the extent possible, the wealth of information they contain.

31. Intrinsic knowledge, connected to people and place, is part of the human heritage and has economic, social and environmental value. International and national level negotiations should ensure that indigenous peoples are able to benefit from the value of their own knowledge. Such negotiations should aim to protect the intellectual rights of indigenous peoples to such knowledge.

32. Modern decision-making structures need to encompass and make use of the multiple views, approaches and value systems (e.g. traditional, scientific, spiritual, gender etc.) of the diverse communities affected by public and private decision-making. The meeting recommends that:

(a) Indigenous and local communities, receive, as appropriate, government support and funding to manage their traditional knowledge and resources more effectively. Research at the community level should be facilitated to allow these communities to document their findings in their own languages and to follow ethical guidelines of their own making. Such findings should be incorporated as an input to local and national aggregation efforts through the establishment of fora and networks for the exchange of this information.

(b) Institutional and legal structures for the application of traditional knowledge to sustainable resource and community management be established or be strengthened where they exist.

(c) Ecological indicators that incorporate local and traditional sources of information such as species number, migration patterns, changes in weather and vegetation, should be utilized to better understand the complexity of the ecosystem.

B. Data Gaps and Information Systems

Harmonization and Rationalization of Data and Indicators

33. There are significant efficiencies to be gained through improved harmonization in data collection at the international, national and local levels and the meeting:

(a) Calls on international organizations to streamline international data collection by building on existing efforts in harmonization of indicators, methodologies and data standards and recognizes the important role the UN Statistical Commission and the ACC Subcommittee on Statistical Activities," can play in this regard.

(b) Recommends that international organizations and convention secretariats be clear about the purpose of data requests and standardize and harmonize their requests for data to the extent possible.

(c) Urges national governments to use standard methodologies and data attributes to manage national data collection systems in conformity with international standards where appropriate.

(d) Recommends that governments adopt quality assurance processes to ensure data is valid, reliable and traceable.

Weaknesses in Data Collection and Core Data Sets

34. There is a need to develop tools to transform collected and analyzed data and indicators into usable information for relevant stakeholders and decision-makers. To do so, the meeting:

(a) Recommends that the UN develop a common framework for identifying those core data sets and information that are critical for the implementation of sustainable development and related multi-lateral agreements.

(b) Calls upon national governments, the UN system and international organizations, particularly those organizations dealing with environment and sustainability issues to mainstream sustainable development data and information procedures and services, by institutionalizing and strengthening integrated geo-spatial information systems for collecting, analyzing and value-added processing of information for policymakers and other user-groups.

(c) Recommends that national governments establish a system for relevant data-collection and information processing for promoting Agenda 21 at national and local levels taking into account the needs of different stakeholders and decision-makers for information and knowledge about environmental, socioeconomic and cultural issues.

(d) Urges national governments to develop standard protocols for non-governmental organizations, for use in their community "watch" projects, and to provide common forms or "architectures" for reporting their data.

(e) Recommends that national governments develop strategic partnerships with non-governmental organizations (and the private sector) to stimulate innovative data generation and collection methods.

C. New Information Technologies

Remote Sensing and Space Technologies

35. Space science technologies for satellite Earth observation, satellite-based positioning and navigation, and satellite communications are advancing rapidly and new applications continue to emerge and play an increasingly important role in sustainable development. The applications of remotely sensed data for sustainable development are extremely diverse and have potential applications in nearly every sector of the society from the medical profession to business to policy making for sustainable development. The meeting, therefore:

(a) Encourages satellite operators, relevant international organizations and agencies to (i) provide cost effective access to space technology inputs for sustainable development, (ii) help with capacity building in developing countries to interpret, analyze and integrate satellite based information into operational applications.

(b) Recommends that the United Nations encourage the networking of decentralized data repositories applicable to distance education, telemedicine, natural resource accounting and weather and climate forecasting, agricultural development, environmental and natural resource management, poverty alleviation and sustainable development planning, to name a few.

(c) Recommends that the United Nations promote government, non-government and private sector coalitions to facilitate the sharing of space science research and technologies between developed and developing countries.

(d) Recommends that continued work and research be done on developing models based on user-friendly formats and styles that allow decision-makers to make informed decisions in policy development, for example in disaster mitigation and management.

Internet-based Information Systems

36. The rapid changes in technologies provide both opportunities and challenges for the dissemination of sustainable development information. Internet-based information systems possess great potential for wider connectivity and accessibility to the public at large. The meeting:

(a) Calls upon governments, international organizations, non-governmental organizations and the business community to establish a strategic partnership for the formulation and implementation of forward-looking strategies for the development and networking of Internet-based Information Systems. The UN and related international organizations are urged to provide advice, technical and other forms of assistance in such an undertaking.

(b) Urges member governments and international organizations to identify areas of priority and provide adequate support to the development of innovative prototypes of

web-based information systems with the possibility of them being further developed and scaled into operational systems.

(c) Recommends that Governments and international organizations support initiatives to introduce, develop and implement multi-lingual and multi-dialect capabilities in internet-based systems, so as to ensure the widest dissemination of information, in particular, to those groups currently excluded.

(d) Recommends that a step-by-step approach be taken to the implementation of a web-based information system. A combination of on-line and off-line strategies should be promoted, to encompass those people who currently do not have access to the Internet.

D. Partnerships for Financing and Mutual Support for Sustainable Development Information

37. Concerns were raised about the difficulties in mobilizing financial resources for the development of information systems for sustainable development. The meeting discussed both the political and economic obstacles to mobilizing financial resources for information related to sustainable development. The meeting:

(a) Recommends the formation of strategic partnerships between Government agencies, civil society groups, multilateral organizations and the private sector to mobilize political and financial support for national information infrastructures within which sustainable development information systems can be developed and improved through wide participation.

(b) Encourages bilateral and multilateral donors to ensure that development assistance includes building information capacity for sustainable development at a national level.

(c) Recommends the identification of innovative approaches, including making more efficient use of existing infrastructure, to provide local solutions for mobilizing financial resources and effective implementation of information objectives for sustainable development.

(d) Recommends that governments and other stakeholders take fully into account and promote understanding of the strategic benefits of well-functioning information systems for sustainable development, including benefits to the economy as a whole.

(e) Calls upon countries to prioritize essential sustainable development information needs that have high possibility of success to focus scarce financing towards pilot information products that demonstrate the effectiveness and the economic impact of sustainable development information to policy makers.

(f) Encourages the sharing of experiences gained on the national and international level in elaboration of best practices for disclosure of information and the free and unrestricted exchange of environmental data and information-related products.

(g) Invites governments, business and multi lateral organizations to strengthen existing centers of excellence through reinforcing their institutional and technical capability as network information nodes that combine electronic and traditional knowledge of information handling.

(h) Recommends that developing countries have free, open and unrestricted access, where appropriate, to data and information essential to sustainable development, originating in their own territory but held in developed countries.

E. Looking Forward

38. Chapter 40 lays the foundation for transition to the new knowledge based economy of the 21st century. The new knowledge economy has the potential to enhance our individual skills, facilitate greater resource efficiency and promote technological advances to help reduce the gap between developed and developing countries and between rich and poor. The new knowledge economy presents us with both an opportunity and a challenge. We can take advantage of this opportunity only if we increase our investment in human beings, recognize the value of diverse views, and appreciate the power of stakeholder participation. We can meet the challenge by building information infrastructures, adopting conducive policy and regulatory frameworks, fostering an open business climate with improved services and financing, and generally supporting measures to ensure that people everywhere can benefit from the information revolution. Greater access to information and wider public participation in the use of information can be a force that unites rather than divides us.

ANNEX 1

Summary Presentations - Themes and Working Groups

Theme 1: Access to and Uses of Information

Keynote: Mr. Taholo Kami (Fiji)

The SIDSnet Experience

The Small Islands Developing States Network was initiated in 1997 as www.SIDSnet.org. This ambitious attempt to mobilize experts in sustainable development issues in 42 island nations through an Internet based network provides some valuable lessons in the use of information technology as a means for sharing experiences and building global consensus amongst a geographic and culturally diverse group of stakeholders.

The Island experience of isolated and small markets has similarities within all nations. Small remote rural villages and the urban poor are segments of the population that do not attract private investment into needed communications infrastructure. Basic services are often provided at high cost and local capacity is lower then other parts of the community. This is an issue with islands common to even the most developed nations. SIDSnet stakeholders included stakeholders in issues such as climate change, Energy, Coastal and marine resources, Sustainable Tourism, Trade and other issues mandated by the Barbados Programme of action.

Relevant Lessons

Obstacle 1: Internet Access and penetration

Cost is the single biggest obstacle to Internet access in developing countries. Costs range from US$1200 for a basic computer to hourly charges of $1 – 8.00 per hour for a dial up connection. Internet penetration in most developing countries is less then 2% of the population and limited to key urban centers.

Obstacle 2: Local Capacity

The lack of awareness and limited understanding of the benefits of the Internet are detrimental to the development of appropriate information applications and an obstacle to investment in infrastructure. The low computer literacy at all levels of society and the lack of specialized Internet developers and IT technicians/programmers also hinders adoption of the Internet.

Opportunities

1. Examine New Approaches to OLD problems

The opportunity of instant dialogue via email or the Internet provides new solutions to old problems with data collection and processing, access to information and new approaches. The sharing of experiences through a network and the ability to broadcast and compare results across distances are now possible through various new applications such as the UNEP GRID – City State of Environment web based software. Twinning between countries can take advantage of new technology and best practices.

2. Recognize existing information processes

Understanding existing networks can result in a strategically placed Internet connection benefiting large off line communities. A methodical approach to capturing information from current organizational activities is also essential. An example of this is with meetings and seminars held around key development issues. So much information is prepared for meetings it would benefit all parties if a standard approach could be adopted by development and donor organizations to ensure that agendas, participants lists, presentations and reports would be published online within 48 hours from completion of meeting.

3. Speak the Language of Policy Makers

It is recognized that mainstreaming Sustainable Development as part of development policy is necessary. Sustainable Development must tie the benefits of environmental preservation as part of development of Tourism and Trade and other social issues.

The Internet also provides an invaluable tool to inform and enlist the general public to put appropriate pressure on legislators.

The Ground Rules:

1. It's all about People....

   - Sell Value - benefits
   - Connect to objectives

2. Relevance Not Reverence
   - Keep technology in perspective
   - Vehicle for achieving our objectives

3. Innovate..... Break the Rules

Working Group 1: Public Access to Information

Presenter: Ms. Elena Petkova (WRI) – The Aarhus Convention on Access to Information

On June 25, 1998, at the Fourth "Environment for Europe" Ministerial Conference in Aarhus, Denmark, 35 countries and the European Union signed the new UNECE[1] Convention on Access to Information, Public Participation in Decision-Making, and Access to Justice in Environmental Matters (generally known as the Aarhus Convention). The Aarhus Convention provides a framework for environmental governance with its three "pillars": access to environmental information, participation in policies and decisions affecting environment, and provisions for access to judicial redress in case of public agencies failure to implement the first two pillars.

The first pillar: access to information answers 3 major questions:

- What type of information should be made accessible by public authorities? The Convention identifies the following broad categories of information that should be in the disclosed to the public: information about the state of environment, about factors and activities that influence it (e.g. policies, projects) and environmental impacts on human health.
- How should it be made accessible? The convention provides for the use of multi-media channels and procedures for the disclosure of information. It also addresses the question of costs, which should not be prohibitive;
- Who has access? The issues of standing are often controversial. The Conventions approach is that individuals and organizations with interest in the environment should have access to information irrespective of nationality…

The Convention's pillars set common governance standards and create a comparable operating environment for investment in the countries of the UNECE region. These standards are designed to improve accountability, efficiency and effectiveness of environmental management.

Presenter: Mr. Christian Brodhag (France) – Linguistic Obstacles to Information Access

Multilingualism is often perceived at the international level as a handicap that hinders global governance and leads to additional costs for documents translation and simultaneous interpretation during international conferences. The intention of this discussion is to explain the necessity of diversity in language and cultural approaches and to propose some solutions.

Cultural and language diversity are part of sustainable development since they are a basic resource for development. In fact scarcity and resource management have produced very different and original solutions in various societies. The market approach is not the unique solution for scarcity management. Specific production and consumption patterns and social practices adapted to local conditions also can promote high efficiency in resource management. In water management, there are strong differences between temperate and dry countries. Water harvesting technologies and practices, for example, have common grounds in all dry regions. Specific concepts and words that don't exist in northern languages have consequently come into use. South-south transfers in this field imply adequate concept definitions and correct translations.

Concerning the domain of land use, relationships between territory and society appear to be very different in different countries. In the United States economy, for example, land appears to be a simple production factor or a strictly protected natural heritage. In France the relationship is

more complex in the concept of "*terroir*" where cultural, historical and ecological characteristics of local foodstuffs production are close to specific alimentary practices, and the basis of a specific market. For indigenous people and their communities relations with territory also have spiritual and religious connotations. Sustainable land use management implies adequate use of those different approaches. The French term "terroir" has, for example, no equivalent in English.

This issue has some more trivial aspects at all levels: global, national and local. In this respect, the whole set of languages (working and official UN languages, written language, dialect and oral) should be coherent and interlinked. The efficiency of international negotiations on sustainable development, requires an adequate understanding of the concepts, approaches, mechanisms and tools by all stakeholders and must therefore be specifically addressed in the context of multilingualism, with the full use of all UN official languages.

In a top-down view, implementation of sustainable development implies that global issues are correctly passed on to national and local stakeholders, through a coherent information system: using the Internet with specialized, regional portals giving access to local and individuals sites, but also precise definition of terms used through a thesaurus/glossary allowing accurate translations in all languages, both written and oral.

In a bottom up approach, some specialized or local terms and concepts can have a « universal use ». By specialization we understand geographic (bio-regional), linguistic, and disciplinary... To deal with this problem there are solutions: cooperative networks at a global level on specific issues, south south transfer through networking and capacity building, identification and definition of new scientific or technical approaches (ex: ecological rucksack, factor 4).

These problems find some erratic and partial responses. The CSD-9 session on information for decision-making and participation could be the opportunity to launch a more coherent approach with tasks coordinated at the global level, such as:

- A thesaurus/glossary program with definition of terms used in the UN languages context
- A global architecture of Internet with the full use of meta-information and common protocols
- Terminology work in all languages to facilitate understanding of sustainable development issues and to enhance the global value of local solutions.

Working Group 2: Traditional Knowledge and Information

Presenter: Mr. Stephan Augustine (Canada) – Uses of Traditional Knowledge

Chief Augustine in his opening remarks noted that the idea of "incorporating" traditional knowledge into scientific information, for the sole purpose of scientific use (with science being presented as having the ultimate validity) is an offensive approach to other sources of knowledge. It is a "take and leave" approach to whatever is useful, at the time, to scientists, a fragmentation of knowledge for integration purpose. It would be far more appropriate to have a "blending" approach, in which both science and traditional knowledge would be recognized for their own integrity, in the best interest of the public at large. We have to take into account that

the public good is not necessarily synonymous with scientific knowledge and aims, especially in an age where science is more and more at the service of industry (as evidenced by genetically modified foods, nuclear waste, major environmental damages caused by mega-hydro projects, bovine growth hormone, to cite but a few). These are certainly not in people's best interest or environment friendly.

When it comes to access to information, one has to consider what kind of information we speak about. It is also directly linked to levels of education and freedom of information for all in society, not only in developing countries, but as well in so called industrialized countries. In the push for globalization, there is a danger for developing countries to be co-opted to fully embrace western industrialized technologies, knowledge and world views, at the detriment of their own culture and community-based knowledge. On the other hand, there is also the risk of traditional cultural knowledge to be "kidnapped" by industrial science, leaving the holders of that knowledge without a say in how it will be used, for which purposes, or even possibly without access to their own resources (as medicinal plants for instance). Which brings us to the issue of intellectual property rights. In the face of sweeping corporate globalization, how can developing countries and traditional societies develop and implement mechanisms to protect their culturally based knowledge? It doesn't mean that they will not share the benefits of that knowledge, but that they will retain access to the source of their knowledge (which can potentially be destroyed by modern technologies overriding other ways of knowing) and a say in how it is used.

The intensive globalization efforts of the past decade are intent on a "standardized" approach to the world, which flies in the face of regional diversity, cultural diversity and eventually biodiversity. It is our responsibility to put in place a system of checks to balance the increasing encroachment of one single worldview.

The new communications technologies, while they can be a very useful tool for exchanging information and ideas, can also be used negatively to streamline different ways of thinking and ways of knowing. The use of information technologies must be devolved to the hands of communities, and not a top down approach to knowledge coming of the «nations who know" to the rest of the world. Knowledge has to remain diversified, as cultures, as nature itself. That is the whole purpose of the Convention on Biodiversity.

Working Group 3: Problems of Data Collection in Developed and Developing Countries

Presenter: Dr. Edgar E. Gutiérrez-Espeleta (Costa Rica) – Problems of Data Collection

Data collection and the difficulties in combining data from different national units or agencies and among different international sources has been studied and analyzed by different groups. One of these groups is the Data Working Group (DWG) established within the UNEP Global Environment Outlook (GEO) project two years ago and which is still supporting the UNEP GEO process on these matters.

As an introduction for our discussion under this topic, I would like to communicate some of DWG findings under the topic that interests us for this meeting. We have found that there exist

some institutional constraints that affect the development of a reliable and opportune data system for sustainable development decision-making. Among these are:

- Monitoring and data collection infrastructure of most developing countries is severely handicapped or non-existent
- There are limitations in resources, personnel and equipment
- Keeping well trained personnel in publicly funded institutions is difficult
- Data management infrastructure of many countries is weak and data reporting is fragmented
- Data are reported for different geographical areas by different agencies and organizations. As a result, it may be impossible to use and compare otherwise valuable aggregated datasets in global and regional assessments
- There is no organizational mandate to collect and report time-series data internationally on specific issues on a regular basis
- Many issues are not universally relevant. In such cases, not all countries will collect associated data and global datasets will therefore be incomplete

Institutional constraints are not the only ones. There are also technical constraints that make comparing and aggregating information more difficult, such as:

- Definition differences
- Different reporting periods
- Gap filling by various statistical methods
- Conceptual and technical difficulties of measurement
- Differences in measurement method
- Difficulties of access: copyright, high cost, jealousy, competition

These and other problems related to data management and collection make fulfilling the mandates of Agenda 21 Chapter 40 difficult to accomplish.

Theme 2: Data Gaps and Information Technology

Keynote: Mr. Charles Basset (CIDA, Canada)

Mr. Basset noted that while many are drowning in data and gaining vast amounts of computing power, there's a growing gap – of access to information, and opportunity to use and benefit from knowledge. To varying degrees, it's a gap between rich and poor, young and old, urban and rural, male and female.

The knowledge and information gap is even greater than the income disparity between North and South, which doubled during the Development Decades, and keeps on growing. And now – as the information age replaces the industrial era – knowledge is increasingly the most valuable economic asset, and the key factor in production. So the developing world's need to connect, to plug in, to somehow catch up, becomes more urgent and vital with each passing day.

He offered a few thoughts:

- on what kind of information is really needed;
- on the growing gap between the included and the excluded;
- with a few examples that point to how we can respond.

What kind of information, and how do we make it useful?

The sheer volume of information available is growing exponentially, at an unprecedented and accelerating pace. We're up to our necks in diverse, fragmented, unassimilated information flowing from print, from electronic media, from faster and more powerful computers ... and from the Internet, expanding in big-bang fashion, with no end in sight.

Attempting to extract the information we want from this overwhelming flood has been compared to trying to drink from a fire hose. Fortunately, we don't need to know everything, and what we all want is essentially the same: the right information, at the right time, at the right cost, to make wise decisions.

As mentioned in the background document, many developing countries are organizing data and creating information systems. And technical advances – in, for example, remote sensing, computer power, and Geographic Information Systems – are rapidly improving the amount and quality of data available to support decision-making ... while institutionally, a variety of programs and channels are taking shape.

CIDA is an example of an organization that has struggled with the need to turn data and information into knowledge. It might seem ironic – Canada ranks number 6 (between Denmark and the Netherlands) in an index of countries poised to take advantage of the information revolution ... and there's no shortage of computers at CIDA headquarters.

We've got Internet, and intranet, and we're about to get extranet, and maybe we need a safety net. We gather and generate a great deal of data and information.

But do we have the right information at our fingertips? Coding such data – in ways that meet our many users' different needs – is a long-standing problem, aggravated by the growing volume of information at hand.

The information gap

Mr. Basset noted that the information gap is growing. Canada has its own gaps of class, age, location, perhaps even gender, though that may be correcting itself ... and these must be dealt with through domestic policy. In fact, the recent Speech from the Throne outlined the government's goal of bridging some of its own gaps, for example by giving schools and libraries better access to high-speed Internet services.

But by far the biggest and most destructive gap is the gulf between North and South: 15% of our planet's people, in the rich countries, have 90 % of its computers. Meanwhile, sub-Saharan Africa has barely one one-hundredth of the Internet connections that it would be entitled to, if

they were distributed according to population ... and more than half the world's people have never made a phone call.

Yes, there will need to be major investments in telecom infrastructure, and in human resources, as well as better regulatory frameworks, if poorer countries are to take part. But if they focus on the most appropriate and cost-effective technology – often radio, or cellular connections, rather than costly landlines – the investment can be affordable for some governments. Ideally, they can leapfrog over the costly industrial-era stage that developed countries went through, straight into the 21st-century information age.

To help lay the foundations, CIDA is contributing to a variety of new approaches. Canada is major partners, along with the World Bank, in the Global Knowledge Partnership. It's a mixed association of public, private and voluntary sector representatives working toward a common understanding of how technology can support better global sharing of information and knowledge for development.

Bellanet was used in 1998 while updating CIDA's Gender Equality policy. It enabled Canada to carry out consultations, in three languages, with partners around the developing world, so that 'consultation' meant input and feedback in more than just Canadian voices. This first-hand knowledge from the field greatly enriched the process, and grounded the policy in day-to-day reality.

Conclusion

However, these are only beginnings, and we can't let individual success stories mask the reality that the North-South information gap is huge, growing, and too costly in too many ways to ignore. Yes, it will take investment from all sides – from governments, multilaterals, the private sector, and aid agencies like CIDA – of scarce resources that have many other potential uses.

There will be issues of governance and jurisdiction, sovereignty, security, and leadership. People need access to information where it resides – and it was estimated, in 1990, that 90% of the data on Africa was stored in Europe and the United States.

As President Clinton said in April at the White House meeting of global leaders, on the information gap, "the computer and the Internet give us a chance to move more people out of poverty more quickly than at any time in all of human history. But it won't happen by accident. We'll have to work to make it happen".

Working Group 1: Harmonization and Rationalization of Development Data and Indicators

Presenter: Ms. Eszter Horvath (UN Statistical Division) – The UN Experience

An Inventory of Statistical Data-collection Activities, conducted by the UN Statistics Division in 1995, revealed a total of 312 data-collection activities reported by international organizations of which 117 were carried out by international organizations, involving all countries. The overburdening of countries with data requests, duplications in data-collection activities and the

existing gaps and inconsistencies among collected data call for rationalization and harmonization.

In response to the recent global conferences and summits, the demand for indicators has increased in the international arena. The various indicator-related activities undertaken by international organizations have promoted the use of statistics and have generated discussions on data requirements and the need for improvement in definitions, methods and estimation procedures. Moreover, problems with respect to coverage, reliability, inter-temporal and inter-country comparability of the statistical series have been identified.

The problem of the lack of relevant and timely development information has to be addressed through sustained statistical capacity building at the national level, while much better coordination is needed to address the problem of inconsistency among data and indicators disseminated by different agencies at the international level.

There is now widespread acceptance among international agencies on the need for coordination and harmonization to eliminate duplicative requests and share the data collected. The efforts at the international level to achieve better coordination, such as those initiated by ECOSOC and currently being made by the UN Statistics Division will alleviate some of the problems. However, the most pressing issue remains the lack of a sufficient development information infrastructure in many developing countries.

Working Group 2: Financing for Information

Presenter: Mr. David Barry (USA)

Financing for information faces technical and institutional obstacles. Information rarely has a political constituency to support it in a time of budgetary pressure. In the mid 1990's, shrinking Federal budgets led to cuts of many information sources in the U.S. including the environmental damage series of the Bureau of Economic Analysis, elimination of the Bureau of Mines and some of its information on minerals, and in a puzzling move, Congress abolished its own Office of Technological Assessment.

With increasing sensitivity to the importance of data, the Budget of the United States for 2001 has the following text box: Investing in Federal Statistics "Our democracy and economy demand that public and private leaders have unbiased, relevant, accurate, and timely information on which to base decisions. Data on populations, real GDP, and CPI, for example, are critical inputs to monetary, fiscal, trade, and regulatory policy. They also have a major impact on Government spending, budget projections, and the allocation of Federal funds. Taken together, statistics produced by the Federal Government on demographic, economic, and social conditions and trends are essential to inform decisions that are made by virtually every organization and household."

The 2001 Budget include five proposals for strengthening federal statistics pertaining to e-business, the census, the Producer Price Index, implementation of the American Community Survey, and sharing of data among Agencies to improve efficiency. The practitioner of

sustainable development will note that the text and proposals address economic and social information but not environment. This data is not neglected, but covered in individual agency budgets. Placing economic information in the foreground is a presentation strategy. Those who seek to champion the funding of needed information must explore how to effectively present their requests for financial support.

A window on financing information for the future is seen in the set of recommendations for financing the National Spatial Data Infrastructure (NSDI) in the US. This information, usable by those sharing the same region, industry or issue is aimed at supporting communities to build homes and businesses, improve the environment, improve infrastructure and revitalize their economies. The report on the NSDI is aimed at raising awareness about the value of this information to enable the needed funding to bring the infrastructure into being.

Working Group 3: Weakness in Data Collection

Presenter: Mr. Jan Bakkes (RIVM, Netherlands) – Improving Core Data Sets

Over the past years the demand for sustainable development data has shifted to a demand for explicit and policy-oriented assessments. A good example is the development of UNEP's GEO network and reports. However, this shift towards assessments does not remove the problems with the underlying data. In fact, the work for global assessments has revealed that their data foundation is dangerously weak in some respects, for example when it comes to monitoring progress over time.

One permanent problem is that many of the necessary data sets are required for the work of not one but many different organizations. Consequently, responsibilities for this largely common basis of data are often unclear or not taken. Other permanent problems are: misunderstandings persist (such as: 'there is data enough' or 'earth observation will solve all data needs'); primary collection is costly and time-consuming to set up or modify; the way from source to user is often long, with the effect that by the time data are used in global or regional assessments, national experts view them as obsolete.

Data work for GEO-2000 has reminded those involved that up to three-quarters of the data required are non-environment data. In addition, a straight compilation of country data for 150 key variables from the customary international sources proved to be unusable, because of inconsistencies, errors and incompatibility between globally consistent sets and nationally acknowledged data. It also underlined that in capacity building an important aspect is the ability to work with contradictory information. Finally, as impacts on specific groups and ecosystems are getting more attention, requiring analysis at various scales, spatially explicit information is becoming more in demand.

Various lines of action offer themselves: (1) Information analyses for specific assessments can be completed. At the international level this should be done for monitoring progress for global and regional conventions. Such analyses require only a small effort, but lay the basis for needs-driven improvement of data availability. (2) For organizations working on assessments, it does make sense to set up and maintain specific integrated data collections comprising the core of

their input data. They should be encouraged to provide external access to such collections. (3) Improving technical access through portals and the like can be a useful line of action. However, it has to be borne in mind that this is essentially a supply-driven approach that only makes sense if the supply is good enough. Too often, this is not so. (4) With respect to capacity building on data issues, it makes sense to concentrate on learning by doing in the context of assessments. Again, GEO is an example. (5) The ongoing attempts at coordination between the various earth observation systems should be encouraged, especially with respect to providing tangible results such as easier and coordinated access to the information outputs of the systems.

Theme 3: New Information Technologies

Keynote: Mr. Robert Ashe, Cognos, Inc.

Mr. Ashe explained to the Meeting, that Cognos works in the area of facilitating access to, and exchange of "business intelligence". Their main task is to ensure that technology meets the needs of citizens by providing tools for changing raw data into useable information or "knowledge". To this end, they work with organizations in understanding the types of information needs that exist, which types of information an organization is dealing with and consequently what is required to reach an integrated solution to a specific problem. A major objective is to ensure that different people within an organization, having different priorities or areas of concentration, are all speaking the same language.

Mr. Ashe also mentioned that the paper-based, centralized view of information has evolved into being decentralized and digital, and that the client-server focus is shifting to the Inter-net, which has served to change the value of information. Since e-business equals transactions, it is fundamental to forge connections over the Internet.

Working Group 1: The Promise of New Technologies

Presenter: Mr. V. Jayaraman (India) – Satellite Remote Sensing

Mr. Jayaraman brought out the need for long-term consistent measurements of key physical variables to study the shifts in state and variability of Earth system components. Particularly, he emphasized the importance of understanding the ecosystems globally so as to act rationally at local levels. Global phenomena such as greenhouse effect, El Nino, and acid rain jostle for attention along with local problems such as deforestation and soil erosion, which in aggregate have global consequences. Earth observation from space is one of the most viable technology means for understanding the Planet Earth and the various associated scientific uncertainties. Mr. Jayaraman specifically brought out the role of space technology in Agenda 21 implementation. Satellite remote sensing provides vital information on environmental impacts, resources data/ accounting, and inputs for integrated development plans for both rural and urban settings. Satellite communication provides connectivity to the remote villages, including meteorological information services as well as developmental education communication to the needy. Mr. Jayaraman elaborated on some of the down to earth applications using satellite remote sensing in various natural resources and environmental applications, as well as emerging scenarios in global earth observation satellites. The advent of more than 230 instruments in over 70 satellite

missions in the next 10-15 years with calibrated sensors providing a wide variety of data provides an opportunity for the scientists to understand the complex interactions between various components of the non-linear, coupled Earth system. He emphasized the role of evolving Integrated Global Observing Strategy (IGOS), wherein space based observations are appropriately linked with the ground-based observations. In addition, he emphasized the role of the enabling technologies such as Geographical Information Systems, Satellite Positioning Systems, Photogrammetry, Artificial Intelligence and Neural Networks in enriching the satellite based information for providing services to the user community. With the digital information revolution becoming a reality, the seamless integration of satellite based services on the information super highway along with other conventional services is the order of the day providing the services to the users in a format and style understandable to them. Mr. Jayaraman also emphasized the need for appropriate human resource development and involvement of scientists from various areas to work together to understand and implement the scientific solutions to ensure sustainable development.

Working Group 2: New Multi-media Technologies

Presenter: Mr. Peter Hardi (IISD, Canada) – The Dashboard of Sustainability

Information and reporting tools on SD have two tasks: Influence the public discourse and influence decision-makers. We need to communicate the same message, in different packaging. It is a two-way process, involving "encoding" and "decoding" an expert content for public consumption. Means that are reviewed: Multi-media presentations, GIS, and metaphors and graphics.

1. Multi-Media. Best examples:

- CNN's People Count, an award winning television series, showing real people making real progress for a better tomorrow: http://www.peoplecounttv.com/. (Reporter and executive producer Barbara Pyle)
- Real audio presentations of York Centre for Applied Sustainability on SD: http://www.yorku.ca/ycas

Challenge of multi-media presentation of information:
How can we link the message of high-powered, high-speed clips to quantitative information? We need to transform visual and narrated emotions of a drama to politically effective tools.

2. GIS. Best examples:

Community Sustainability Indicators: http://www.crit.com/
Indicators of Housing and Neighborhood Quality (University of Wisconsin) http://www.uwm.edu/Dept/GIS/illus/indicators.html
Internet Resources, Maps and Indicators, GIS: WRI http://www.igc.org/wri/indictrs/maplinks.html

Challenge of GIS presentations:

How can we interpret the contextual complexity of mapping presentations in terms of aggregation? The task is to superimpose fragmented data, like solving a jigsaw puzzle.

3. Metaphors and graphic presentations

These tools include verbal or graphic symbolism in transmitting information. They help simplify system characteristics, help focus our message, provide visually engaging tools.

Challenges of metaphors

How to translate popularized presentations to decision-making tools? We need to comprise complex messages in a catchphrase or in a single image: It is like "zipping" information. Presenting metaphors we need to help open a "zip-file" and communicate the content.

Illustrations for metaphors:

WWF International: Living Planet http:www.panda.org/livingplanet/lpr/index.htm
IISD-CGSDI: Dashboard, http:iisd.ca/cgsdi/dashboard dsply.htm

Working Group 3: Making Sustainable Development Information Widely Available

Professor Nazli Choucri (MIT, USA) - Web-based Information Systems

Introduction. This session focused on advances in Internet-based technologies, addressing (a) new challenges and opportunities in uses of information for decision-making, and (b) specific examples of collaborative response strategies, implementation, and management.

Challenges & Opportunities. Key challenges include making e-information widely available, managing web-based information systems, organizing masses of materials, meeting needs of diverse groups, reducing barriers to internet and intranet access, and managing mattes of cost and price. Significant opportunities are afforded by: knowledge networking practices, multilingual capacities, mirror-site and distributed management, strategic partnerships, and coupling localization and globalization.

Strategies & Implementation. Detailed attention was given to the ongoing international knowledge networking initiative – Global System for Sustainable Development (GSSD) -- since it appeared to be the only multilingual, mirror sited, globally distributed knowledge network. Developed at MIT, and hosted by the Government of China, Ministry of Science and Technology (ACCA21), The American University in Beirut, and Ecole Des Mines St. Etienne, France, GSSD

operates in Chinese, Arabic, French, and English, and soon in Italian, Spanish, and Japanese, and mirror sited locally.

Conclusion. This distributed strategy ensures strategic collaboration worldwide, effective response to cultural diversity, and joint responsibility in information management, diffusion, and feedback – as well as reliable provision of knowledge from local sources into global networks.

ANNEX 2

INTERNATIONAL EXPERT MEETING ON INFORMATION FOR DECISION MAKING AND PARTICIPATION

Château Cartier Resort
Aylmer, Quebec
September 25–28, 2000

Goal of **Chapter 40 of Agenda 21**:

- To bridge the data gap in the availability, quality, coherence, standardization, and accessibility between the developed and the developing world.
- To improve the availability of information.

Objectives of the Meeting:

- To provide advice and recommendations to the CSD on the kinds of policies that should be adopted by governments to further implementation of chapter 40 of Agenda 21, namely information for decision-making.
- To provide substantive inputs for the report of the Secretary-General on this topic.

Programme			
Pre-meeting session	**Day 1**	**Day 2**	**Day 3**
Monday September 25 ***14:30 – 17:30***	***Tuesday*** September 26 ***09:30 – 17:30***	***Wednesday*** September 27 ***09:00 – 18:00***	***Thursday*** September 28 ***10:00 – 12:30***
Informal consultations with testing country representatives about their experience with the United Nations indicators program	**Theme 1**: Access to and Uses of information	**Theme 2**: Bridging the Data Gap **Theme 3**: New Information Technologies	Conclusions and recommendations on information for decision making

---

Pre-meeting session	**Indicators as tools for decision making**	**Lauréat Room**
Monday September 25 ***14:30 –17:30***	*Informal consultations with representatives of countries testing the CSD indicators as tools to support national decision-making processes and the progress made in this direction by the CSD Work Program on Indicators of Sustainable Development.* Led by Mr. Lowell Flanders, United Nations Department of Economic and Social Affairs (UNDESA)	

Tuesday September 26	**Day 1** **Welcome and Theme 1: Access to and Uses of Information**	
08:45 – 09:30	Registration / Continental breakfast	Foyer
09:30 – 09:40	Welcoming remarks — Ms. Elizabeth Dowdeswell, Chair Former Under Secretary General and Executive Director of the United Nations Environment Programme (UNEP)	Chaudière C
09:40 – 10:00	Welcoming speech — Mr. Alan Nymark Deputy Minister, Environment Canada, on behalf of the Government of Canada	Chaudière C
10:00 – 10:20	Welcome and organization of the meeting Mr. Lowell Flanders (UNDESA) and Mr. Arthur Dahl (Coordinator, Earthwatch, UNEP)	Chaudière C
10:20 – 10:40	Presentation on CSD Indicators Program Mr. Lowell Flanders	Chaudière C
10:40 – 11:00	Discussion	Chaudière C
11:00 – 11:15	Coffee break	Foyer
11:15 – 11:45	Keynote presentation on Theme 1: Access to and Uses of Information	Mr. Taholo Kami, Internet for Development Consultant, SIDSnet Chaudière C
11:45 – 13:00	Working groups — **Theme 1: Access to and Uses of Information**	
	Group One	**Artiste A**

Public access to environmental information, as exemplified in the adoption in 1998 of the Aarhus Convention on Access to Information, Public Participation in Decision Making, and Access to Justice in Environmental Matters. Issue of in-creasing access among those presently excluded from the information revolution. Issue of training in how to use newly available information for decision-making.

Presenters: Ms. Elena Petkova (World Resources Institute) and Mr. Christian Brodhag (École nationale supérieure des mines de Saint-Étienne)

Group Two **Artiste B**

Progress in the collection and use of traditional information under the Convention to Combat Desertification, the Convention on Biological Diversity, and other instruments and agreements. Bottom-up approach of incorporating knowledge of major groups into scientific information with the aim of reinforcing scientific information.

Presenter: Mr. Stephen J. Augustine (Canadian Museum of Civilization)

Group Three **Lauréat Room**

The particular problems of data collection in developed and developing countries, and the difficulties in obtaining and combining data from different ministries for an integrated view of sustainable development. Issue of institutional problems of integrating information within governments and combining information from economic, social, and environmental sectors. Technical problems of integrating information at the local, national, regional, and global levels.

Presenter: Mr. Edgar Gutiérrez-Espeleta (University of Costa Rica)

12:30 – 14:30	Exhibits	Salon B
13:00 – 14:30	Lunch	Chaudière A
14:30 – 16:00	Continuation of working groups	As indicated above prior to lunch
16:00 - 16:15	Coffee break	Foyer
16:15 – 17:30	Reports to the plenary and discussion of working group results	Chaudière C
17:00 – 20:00	Exhibits	Salon B
18:00 – 19:00	Reception — hosted by Dr. Robert Slater, Senior Assistant Deputy Minister, Environment Canada	Foyer
19:00 – 20:30	Dinner	Chaudière A

Wednesday September 27	**Day 2** **Theme 2: Bridging the Data Gap and** **Theme 3: New Information Technologies**

07:30 – 08:30	Continental breakfast	Foyer
08:30 – 09:00	Remarks — Dr. Bedrich Moldan, Chairman of the Ninth Session of the Commission on Sustainable Development	Chaudière C
09:00 – 09:30	Keynote presentation on Theme 2: Bridging the Data Gap Mr. Charles Bassett, Senior Vice President, Canadian International Development Agency	Chaudière C
09:30 – 11:30	Working groups — **Theme 2: Bridging the Data Gap**	

Group One **Artiste A**

Problems of non-uniform standards and methods for handling information. The need for harmonization and rationalization of development data and indicators in an attempt to address the growing number of data requirements.

Presenter: Ms. Eszter Horvath (United Nations Department of Economic and Social Affairs)

Group Two **Artiste B**

Financing of information, including issues related to reductions in government support for essential observations. Need to shift data collection from research programmes to operational systems. Need to build long-term time series on global change. Commercialization of information, intellectual property rights, and the need to maintain and develop information services in the public interest.

Presenter: Mr. David Berry (Interagency Working Group on Sustainable Development Indicators)

Group Three **Lauréat Room**

Weaknesses in the data collection, analysis, assessment, and reporting processes. Need to eliminate bottlenecks in the information system. Improving core data sets, strengthening assessment capacities, institutionalization of information systems, and integration of information systems from data collection through to delivery to users.

Presenter: Mr. Jan Bakkes (UNEP Collaborating Centre for Assessment, Reporting and Forecasting at RIVM)

11:30 – 11:45	Coffee break	Foyer
11:45 – 13:00	Reports to the plenary and discussion	

	of working group results	Chaudière C
12:30 – 14:30	Exhibits	Salon B
13:00 – 14:30	Lunch	Chaudière A
14:30 – 15:00	Keynote presentation on Theme 3: New Information Technologies Mr. Robert G. Ashe, Senior Vice President, Worldwide Customer Services, Cognos	Chaudière C
15:00 – 16:00	Working groups — **Theme 3: New Information Technologies**	

Group One **Artiste A**

The possibilities opened up by new technologies. Growing flood of some types of information (such as from satellite remote sensing) and implications for increased assessment capacities. The potential for more rapid and targeted delivery of information to decision makers in near-real time.

Presenter: Dr. Venkatakrishnan Jayaraman
(Indian Space Research Organisation)

Group Two **Artiste B**

New multimedia technologies and tools such as indicators and animated graphical presentations that are opening new avenues for preparing and presenting information in formats more easily understood by decision makers and the general public. Practical applications of GIS and map-based information tools that have expanded rapidly in recent years as tools allowing for visual assessment of impacts and of resources available to address problems and emergencies.

Presenter: Mr. Peter Hardi (Measurements and Indicators Program,
International Institute for Sustainable Development)

Group Three **Lauréat Room**

Efforts to make electronic sustainable development information as widely available as possible, including the development of Web-based information systems, and the challenges of organizing masses of information to be easily accessed by and appropriate to different user groups. Need to provide electronic access for disadvantaged groups and countries.

Presenter: Dr. Nazli Choucri (Technology and Development Program,
Global System for Sustainable Development,
Massachusetts Institute of Technology)

16:00 – 16:15	Coffee break	In respective working group locations
16:15 – 17:00	Continuation of working groups	As indicated above
17:00 – 18:00	Reports to the plenary and discussion of working group results	Chaudière C
19:00 –21:00	Exhibits	Salon B

20:00 – 22:30	Barbecue dinner	Outdoor patio

Thursday September 28	**Day 3** **Conclusions and Recommendations on Information for Decision Making**

09:00 - 10:00	Continental breakfast	Foyer
10:00 – 11:30	Adoption of the main conclusions and recommendations of the meeting	Chaudiere A
11:30 – 12:30	Closing remarks	Chaudière A
12:45 – 13:30	Lunch	Chaudière B

This meeting would not have been possible without the contribution and collaboration of Agriculture and Agri-Food Canada, the Canadian International Development Agency, the Department of Foreign Affairs and International Trade, Environment Canada, Health Canada, Industry Canada, and Natural Resources Canada.

ANNEX 3

INTERNATIONAL EXPERT MEETING ON INFORMATION FOR DECISION-MAKING AND PARTICIPATION (Chapter 40 of Agenda 21) Ottawa, Canada 25-28 September 2000

LIST OF PARTICIPANTS

COUNTRY REPRESENTATIVES:

AUSTRALIA

1. Mr. Con **Boekel**
   Head, Environment Information and Technology Strategies Branch
   Department of Environment and Heritage
   Environment Australia
   GPO Box 787
   Canberra ACT 2601, Australia
   Fax No.: (61-2) 6274-2028
   Tel. No.: (61-2) 6274-2031
   E-mail: con.boekel@ea.gov.au

BARBADOS

2. Ms. Amrikha D. **Singh**
   Environmental Research Officer
   Ministry of Environment, Energy and Natural Resources
   Government of Barbados
   4th Floor, Sir Frank Walcott Building
   Culloden Road, St. Michael
   Barbados, West Indies
   Fax No.: (246) 437-8859
   Tel. No.: (246) 431-7686/8
   E-mail: envdivn@caribsurf.com

BELGIUM

3. Ms. Natacha **Zuinen**
   Expert in the Task Force Sustainable Development
   Federal Planning Office
   47-49, Avenue des Arts
   1000 Bruxelles, Belgium
   Fax No.: (32-2) 507-7486
   Tel. No.: (32-2) 507-7472
   E-mail: nz@plan.be

BRAZIL

4. Mr. Guido **Gelli**
   Diretor de Geociências
   Instituto Brasileiro de Geografia e Estatistica - IBGE
   Avenida Brasil 15671
   Parada de Lucas
   Rio de Janeiro
   RJ 21241-051, Brazil
   Fax No.: (55-21) 481-2650

Tel. No.: (55-21) 514-4998/4997/4999
E-mail: gelli@ibge.gov.br

CANADA

Chair

5. Ms. Elizabeth **Dowdeswell**
605-225 Davenport Road
Toronto, Ontario M5R 3R2, Canada
Fax: (416) 925-8125

6. Mr. Stephen J. **Augustine**
Native History Researcher
Ethnology Services Division
Canadian Museum of Civilization
100 Laurier Street, P.O. Box 3100, Station B
Hull, Quebec, J0X 4H2, Canada
Fax No.: (819) 776-8429
Tel. No.: (819) 776-8495
E-mail: stephen.augustine@civilization.ca

7. Mr. Charles **Bassett**
Senior Vice President
Canadian International Development Agency
200 Promenade du Portage
Hull, Quebec K1A 0G4, Canada
Fax No.: (819) 953-3352
Tel. No.: (819) 994-8208
E-mail: charles_bassett@ACDI-CIDA.gc.ca

8. Dr. David **Bell**
Director
York Centre for Applied Sustainability
4700 Keele Street
Toronto, Ontario M3J 1P3, Canada
Fax No.: (416) 736-5436
Tel. No.: (416) 736-2100, ext. 77095
E-mail: dvjbell@yorku.ca

9. Ms. Charlene **Bomberry**
Manager
Six Nations Geo Systems
P.O. Box 460
Ohsweken, Ontario, Canada N0A 1M0
Tel No.: (519) 445-2822
Tel No.: (800) 439-6144
Fax No.: (519) 445-0655
E-mail: charlene@sngeo.com or www.sngeo.com

10. Ms. Carolyn **Cahill**
National Round Table on the Environment and the Economy Secretariat
344 Slater Street, Suite 200
Ottawa, Ontario KIR 7Y3, Canada
Tel. No.: (613) 992-7155
E-mail: mcquintyd@nrtee-trnee.ca

11. Dr. Ann **Dale**, Ph.D.
Science, Technology and Environment Division
Royal Roads University
2005 Sooke Road
Victoria, BC, V9B 5Y2, Canada
Fax No.: (250) 391-2610
E-mail: Ann.Dale@royalroads.ca

12. Mr. Peter **Hardi**
Senior Fellow and Director
Measurement and Indicators Program
International Institute for Sustainable Development
161 Portage A, 6th Floor
Winnipeg, Manitoba R3B OY4, Canada
Fax No.: (204) 958-7710
Tel. No.: (204) 958-7731
E-mail: phardi@iisd.ca

13. Mr. Bill **Jarvis**
Director General
Policy Research Directorate, Policy & Communications
Environment Canada
10 Wellington Street, 24th Floor
Hull, Quebec K1A 0H3, Canada
Fax No.: (819) 953-9412
Tel. No.: (819) 953-0344
E-mail: bill.jarvis@ec.gc.ca

14. Ms. Anne **Kerr**
Manager, Indicators and Assessment Office
Environment Canada
351 St. Joseph Blvd., 9th Floor
Hull, Quebec K1A 0H3, Canada
Fax No.: (819) 994-5738
Tel No.: (819) 994-9570
E-mail: anne.kerr@ec.gc.ca

15. Dr. Richard D. **Robarts**
Director, UNEP GEMS / Water Collaborating Centre
Environment Canada NHRC
11 Innovation Blvd. Room 1284
Saskatoon, Saskatchewan S7N 3H5, Canada
Fax No.: (306) 975-5143
Tel. No.: (306) 975-6047
E-mail: richard.robarts@ec.gc.ca

16. Mr. Alan **Willis**
c/o Canadian Institute of Chartered Accountants (CICA)
277 Wellington Street West
Toronto, Ontario M5V 3H2, Canada
Fax No.: (416) 204-3414
Tel. No: (416) 977-3222, ext. 519
E-mail: alan.willis@cica.ca

CHILE

17. Ms. Rayen **Quiroga Martinez**
Advisor to Executive Director
Comision Nacional del Medio Ambiente de Chile
Obispo Donoso 6 - Providencia
Santiago, Chile
Fax No.: (56-2) 244-3437
Tel. No.: (56-2) 240-5756
E-mail: rquiroga@conama.cl

CHINA

18. Mr. **Mi** Jintao
Programme Officer
State Environmental Protection Administration
115 Xizhimennei, Nanxiaojie
Beijing, 100035, The People's Republic of China
Fax No.: (86-10) 6615-9813
Tel. No.: (86-10) 6615-1769
E-mail: mijintao0301@sina.com

COSTA RICA

19. Ms. Patricia **Chaves**
Minister Counsellor
Permanent Mission of Costa Rica to the United Nations
211 East 43rd Street, Room # 903
New York, N.Y. 10017, USA
Fax No.: (212) 986-6842
Tel. No.: (212) 986-6373 ext. 22
E-mail: jnll00@aol.com

CZECH REPUBLIC

20. Ms. Paula **Chyska**
Czech Environmental Institute
Vrsovicka 65, Prague 10010, Czech Republic
Fax No.: (420-2) 7173-7721/6731-0307
Tel. No.: (420-2) 6712-2678
E-mail: chyska@ceu.cz

FINLAND

21. Ms. Ulla **Rosenström**
Senior Scientist
Finnish Environment Institute
P.O Box 140
FIN-00251, Helsinki, Finland
Fax No.: (358-9) 40-300-382
Tel. No.: (358-9) 40-300-329
E-mail: ulla.rosenstrom@vyh.fi

FRANCE

22. Mr. Christian **Brodhag**
Directeur de Recherches
Ecole Nationale Superieure des Mines de Saint-Etienne
158 Cours Fauriel
42023 Saint-Etienne Cedex 02, France
Fax No.: (33-477) 426-633

Tel. No.: (33-477) 420-017
E-mail: brodhag@emse.fr

GERMANY

23. Mr. Kevin **Grose**
Manager
Information Services, Information, Outreach and Administrative Services
Climate Change Secretariat
Martin-Luther-King-Strasse 8
D-53175 Bonn, P.O. Box 260 124
D-53153 Bonn, Germany
Fax No.: (49-228) 815-1999
Tel. No.: (49-228) 815-1528
E-Mail: kgrose@unfccc.int

24. Mr. Uwe **Taeger**
Deputy Head of Division
German Environmental Ministry
Alexanderplatz 6
Berlin 11055, Germany
Fax No.: (49-1888) 305-3339
Tel. No.: (49-1888) 305-2451
E-mail: taeger.uwe@bmu.de

GHANA

25. Mr. Albert K.M. **Katako**
Deputy Director
Ministry of Environment, Science and Technology
P.O. Box M232, Accra, Ghana
Fax No.: (233-21) 666-828
Tel. No.: (233-21) 666-049
E-mail: barnes@africaonline.com.gh

INDIA

26. Ms. Bina **Bahri**
Under Secretary to the Government of India
Ministry of Environment and Forests
Paryavaran Bhawan
CGO Complex, Lodi Road
New Delhi, India
Fax No.: (91-11) 436-0783/436-3956
Tel. No.: (91-11) 436-3975/436-3677
E-mail: binabahri@usa.net

27. Mr. Rajeev **Lochan**
Counselor (Space)
Embassy of India
2536 Massachusetts Avenue N.W.
Washington D.C., USA
Fax No.: (202) 939-9870
Tel. No.: (202) 939-9811
E-mail: rlochan@hotmail.com

INDONESIA

28. Mr. Eddi S. **Hariyadhi**
State Secretariat

Tl. Veteran no. 17
Jakarta, Indonesia
Fax No.: (62-21) 384-8447
Tel. No.: (62-21) 384-7619
E-Mail: kartogen@vision.net.id

29. Mr. Saut M. **Lubis**
State Ministry of Environment
VL. Dl. Panjaitan, Kav. 42
Gedung B/Lt.5
Jakarta 13410, Indonesia
Fax No.: (62-21) 8590-7285
Fax No.: (62-21) 7500420
Tel. No.: (62-21) 8590-7286
E-mail: saut@indosat.net.id or sector21@cbn.net.id

KENYA

30. Ms. Consolater W. **Kiragu**
Environment Officer
Government of Kenya
Bruce House, Standard Street
Nairobi, Kenya
Fax No.: (254-2) 248-851
Tel. No.: (254-2) 243-088 or 243-839
E-mail: mec@nbnet.co.ke

MALAYSIA

31. Mr. Mohammad Fikry Bin **Aziz**
Head of Primary Industries Division
Department of Statistics
14th Fllor, Tabung Haji Building
Jalan Tun Razak
Kuala Lumpur, Malaysia 50514
Fax No.: (60-3) 2162-2496
Tel. No.: (60-3) 2162-1424
E-mail: aziz_mohamad@stats.gov.my

MEXICO

32. Mr. Biol. Sergio Eric D. **Barrios Monterde**
Jefe de Departamento de Indicadores Ambientales Globales
Av. Revolución No. 1425
Nivel 9, Col. Tlacopac San Angel
Mexico, D.F. C.P. 01040
Fax No.: (56-24) 35-84
Tel. No.: (56-24) 34-54/34-55
E-mail: sbarrios@ine.gob.mx

33. Mr. Roberto **Lopez Perez**
Coordinator of Studies on Environment
Instituto Nacional de Estadistica, Geografia e Informatica
Heroe de Nacozari Sur 2301, Puerta 11, Primer Nivel
Aguascalientes, AGS., Mexico
Fax No.: (52-49) 181-478
Tel. No.: (52-49) 105-437
E-mail: rlopez@cnes.inegi.cob.mx

34. Mr. Yosu **Rodriguez Aldabe**
Director General de Estadistica e Informatica
Secretaria de Medio Ambiente, Recursos Naturales y Pesca
Av. Anillo Periferico 4209, PB
Colonia Jardines en la Montaña, Tlalpan
Mexico City, Mexico 14210
Fax No.: (52-5) 490-0934
Tel.No.: (52-5) 628-0853
E-mail: yosu@semarnap.gob.mx

PHILIPPINES

35. Mr. Felizardo K. **Virtucio**, Jr.
Director
Agriculture Staff
National Economic and Development Authority
3rd Fl., NEDA Bldg.
Amber Ave., Shaw Blvd.
Pasig City 1600, Philippines
Fax No.: (63-2) 633-6015
Tel. No.: (63-2) 631-3714
E-mail: fkvirtucio@neda.gov.ph

RUSSIA

36. Dr. Olga **Ponizova**
Program Director
ECO-Accord
37-61 Sheremetievskaya Str.,
Moscow, Russia 127521
Fax No.: (7-095) 925-9282
Tel. No.: (7-095) 219-6015
E-mail: accord@olgapon.qins.msk.su

SOUTH AFRICA

37. Mr. J Rudi **Pretorius**
Director, Environmental Information and Reporting
Department of Environmental Affairs and Tourism
Corner of Pretorius/vander Walt Street
Fedsure Forum Building
Pretoria 0001, South Africa
Fax No.: (27-12) 320-5469
Tel. No.: (27-12) 310-3713
E-mail: rpretorius@ozone.pwv.gov.za

SRI LANKA

38. Mr. D. P. **Munaweera**
Deputy Director
Forest Resource Planning
82, Sampathapaya
Rajamalwatia Road
Battaramulla, Sri Lanka
Fax No.: (94-1) 877-292
Tel. No.: (94-1) 866-612
E-mail: munaw@panlanka.net

UNITED STATES OF AMERICA

39. Mr. David **Berry**
Executive Director
Interagency Working Group on Sustainable Development Indicators
1849 C St. NW, Room 4456
Washington, DC 20240, USA
Fax No.: (202) 208-5602
Tel. No.: (202) 208-4839
E-mail: david_berry@ios.doi.gov

CSD BUREAU

40. Dr. Bedrich **Moldan**
Chairman, Ninth Session of the Commission on Sustainable Development
Ministry of the Environment
Vasovicka 65
Prague 10010, Czech Republic
Fax No.: (420-2) 6737-0307
Tel. No.: (420-2) 6712-2916
E-mail: bedrich.moldan@czp.cuni.cz

41. Ms. Alison **Drayton**
Member, CSD-9 Bureau
Counsellor
Permanent Mission of Guyana to the United Nations
866 United Nations Plaza, Suite 555
New York, N.Y. 10017, USA
Fax. No.: (212) 935-7548
Tel. No.: (212) 223-6418
E-mail: alisondusa@netscape.net

UNITED NATIONS ORGANIZATIONS AND AFFILIATES:

UN/DESA/SD

42. Ms. Eszter **Horvath**
Chief, Environment, Energy and Industry Statistics Branch
Statistics Division
Department of Economic and Social Affairs
United Nations
2 UN Plaza, Room DC2-1650
New York, N.Y. 10017, USA
Fax No.: (212) 963-0623
Tel. No.: (212) 963-4581
E-mail: Horvath@un.org

FAO

43. Mr. **He** Changchui
Chief, Environment and Natural Resources Service
Research Extension and Training Division
Sustainable Development Department
Food and Agriculture Organization
Viale delle Terme di Caracalla, 00100 Rome, Italy
Fax No.: (39-6) 5705-5784, 3152
Tel. No.: (39-6) 5705-1
E-mail: Changchui.He@fao.org

IAEA

44. Mr. Gregory **Csullog**
Waste Technology Section
Division of Nuclear Fuel Cycle and Waste Technology
International Atomic Energy Agency
Vienna, Austria
Fax No.: (43-1) 2600-7
Tel. No.: (43-1) 2600-0
E-mail: G.Csullog@iaea.org

UNEP

45. Mr. Arthur **Dahl**
Coordinator, Earthwatch
Division of Environmental Information, Assessment and Early Warning
United Nations Environment Programme
International Environment House
11-13 Chemin des Anemones
CH-1219 Chatelaine, Geneva, Switzerland
Fax No.: (41-22) 797-3471
Tel. No.: (41-22) 917-8207
E-mail: Arthur.Dahl@unep.ch **or** dahla@unep.ch

UNESCO

46. Mr. Peter **Pissierssens**
Head, Ocean Services Section
Intergovernmental Oceanographic Commission (IOC)
United Nations Educational, Scientific and Cultural Organization
1 rue Miollis
75732 Paris Cedex 15, France
Fax No.: (33-1) 4568-5812
Tel. No.: (33-1) 4568-4046
E-mail: p.pissierssens@unesco.org

UNU

47. Dr. Zafar **Adeel**
Academic Programme Officer
Environemt and Sustainable Development
United Nations University
53-70, Junguamae 5-chome
Shibuya-ku, Tokyo 150-8925, Japan
Fax No.: (81-3) 3499-2828 or (81-3) 3406-7347 (direct)
Tel. No.: (81-3) 3499-2811 or (81-3) 5467-1242 (direct)
E-mail: adeel@hq.unu.edu or http://www.unu.edu

WMO

48. Dr. Alexander **Karpov**
Acting Chief
Observing System Division
World Weather Watch Department
World Meteorological Organization
7 bis, Avenue de la Paix
Case postale no. 2300
CH-1211 Geneve 2, Switzerland
Fax No.: (41-22) 7308-021
Tel. No.: (41-22) 7308-222
E-mail: Karpov_A@gateway.wmo.ch

NGO REPRESENTATIVES:

CHARLES UNIVERSITY

49. Mr. Tomas **Hak**
Charles University Environment Center
U Krize 10
Prague 15800, Czech Republic
Fax No.: (420-2) 5610-441
Tel. No.: (420-2) 5108-0344
E-mail: tomas.hak@czp.cuni.cz

CPDC

50. Mr. Gordon **Bispham**
Chairman
Caribbean Policy Development Centre
"Halsworth" Welches
St. Michael, Barbados
Fax No.: (246) 437-3381
Tel. No.: (246) 437-6055/6
E-mail: cpdc@caribnet.net

SIDSNET

51. Mr. Taholo **Kami**
Internet for Development Consultant
Small Islands Developing States Network (SIDSNET)
14 Catalina Road
Suva, Fiji
Fax No.: (679) 302607
Tel. No.: (679) 302607
E-mail: tk@pacificforum.com

WIO

52. Ms. Gowrie **Ponniah**
Assistant Secretary General – External Relations
Worldview International Organization
12 Arethusa Lane, Wellewatte
Colombo 6, Sri Lanka
Fax No.: (94-1) 589-225
Tel. No.: (94-1) 589-648
E-mail: ummulz@wifoundation.org

EXPERTS:

IEPF

53. Ms. Carol **Grass-Ramalingum**
Energy and Environment Institute of Francophonie (IEPF)
56, rue Saint-Pierre
Quebec G1K 4A1, Canada
Fax No.: (418) 692-5644
Tel. No.: (418) 692-5727

INDIAN SPACE RESEARCH ORGANISATION

54. Mr. Venkatakrishnan **Jayaraman**
Director, Earth Observations System
Indian Space Research Organisation

Antariksh Bhavan, New Bel Road
Bangalore, India 560 094
Fax No.: (91-80) 341-7455
Tel. No.: (91-80) 341-6358
E-mail: vjay@isro.gov.in or vjay202@hotmail.com

MINISTRY OF FOREIGN AFFAIRS

55. Dr. Inger-Marie **Bjoenness**
Environmental Adviser
Ministry of Foreign Affairs
P.O. Box 8114 Dep.
0032 Oslo, Norway
Tel. No.: (47-2) 224-3606
E-mail: inger-marie.bjonness@mfa.no

MIT

56. Ms. Nazli **Choucri**
Director
Professor of Political Science, MIT
Associate Director, Technology & Development Programme
Global System for Sustainable Development
Massachusetts Institute of Technology
77 Massachusetts Avenue, E53-490
Cambridge, MA 02139, USA
Fax No.: (617) 258-7989
Tel. No.: (617) 253-5263
E-mail: gssd@mit.edu

RIVM

57. Mr. Jan **Bakkes**
Head, UNEP Collaborating Centre for Assessment,
Reporting and Forecasting at RIVM
National Institute of Public Health and the Environment (RIVM)
P.O. Box 1
3720 BA Bilthoven, The Netherlands
Fax No.: (31-30) 274-4435
Tel. No.: (31-30) 274-3112
E-mail: jan.bakkes@rivm.nl

UNIVERSITY OF COSTA RICA

58. Mr. Edgar E. **Gutiérrez-Espeleta**
Director Development Observatory
University of Costa Rica
San Pedro de Montes de Oca, Costa Rica 2060
Fax No.: (506) 207-3329
Tel. No.: (506) 207-3329 / 3327
E-mail: egutierr@cariari.ucr.ac.cr

WRI

59. Ms. Elena **Petkova**
Senior Associate
Institutions and Governance Program
World Resource Institute
10 G Street NE
Washington D.C. 20002, USA

Fax No.: (202) 729-7759
Tel.No.: (202) 729-7767
E-mail: elenap@wri.org

UNITED NATIONS DIVISION FOR SUSTAINABLE DEVELOPMENT (CO-ORGANIZER):

60. Mr. Lowell **Flanders**
Chief
Policy Integration and Programme Coordination Branch
Division for Sustainable Development
Department of Economic and Social Affairs
United Nations
2 UN Plaza, Room DC2-2242
New York, NY 10017, USA
Fax No.: (212) 963-1267
Tel No.: (212) 963-8792
E-mail: Flanders@un.org

61. Ms. Kirsten **Rohrmann**
Technical Adviser
National Information, Strategies and Institutions Branch
Division for Sustainable Development
Department of Economic and Social Affairs
United Nations
2 UN Plaza, Room DC2-2236
New York, NY 10017, USA
Fax No.: (212) 963-1267
Tel. No.: (212) 963-2137
E-mail: Rohrmannk@un.org

62. Ms. Dorothy **Perricone**
Policy Integration and Programme Coordination Branch
Division for Sustainable Development
Department of Economic and Social Affairs
United Nations
2 UN Plaza, Room DC2-2242
New York, NY 10017, USA
Fax No.: (212) 963-1267
Tel No.: (212) 963-2803
E-mail: perricone@un.org